

(19)



Europäisches Patentamt

European Patent Office

Office européen des brevets



(11)

EP 0 874 575 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:
08.08.2001 Bulletin 2001/32

(21) Application number: **97902161.5**

(22) Date of filing: **03.01.1997**

(51) Int Cl.7: **A47C 7/46**, B60N 2/44,
A47C 7/32

(86) International application number:
PCT/EP97/00019

(87) International publication number:
WO 97/24960 (17.07.1997 Gazette 1997/31)

(54) **IMPROVEMENTS IN AND RELATING TO SUPPORT STRUCTURES FOR INCORPORATION IN A SEAT FRAME**

VERBESSERUNGEN AN TRAGSTRUKTUREN ZUM EINBAU IN EINEN SITZ

AMELIORATIONS CONCERNANT DES STRUCTURES DE SUPPORT A INCORPORER A UN CADRE DE SIEGE

(84) Designated Contracting States:
BE DE ES FR GB IT NL SE

(30) Priority: **05.01.1996 GB 9600161**

(43) Date of publication of application:
04.11.1998 Bulletin 1998/45

(73) Proprietor: **YOUNGFLEX A.G.**
6300 Zug (CH)

(72) Inventor: **DECEUNINCK, Stefaan,**
Pullmaflex Benelux N.V.
B-8560 Wevelgem (BE)

(74) Representative: **Bubb, Antony John Allen et al**
GEE & CO.
Chancery House
Chancery Lane
London WC2A 1QU (GB)

(56) References cited:
EP-A- 0 552 904 WO-A-94/00039
FR-A- 2 386 287

Lumbar with Flexwires in Cross
Applicant: Maxime Samain et al.
Attorney Dennis J.M. Donahue, III
Attorney Ref. No. 41170-171

6 of 6

Note: Within nine months from the publication of the mention of the grant of the European patent, any person may give notice to the European Patent Office of opposition to the European patent granted. Notice of opposition shall be filed in a written reasoned statement. It shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

Description

[0001] This invention concerns an improved support structure for incorporation in a seat frame, and more especially such a structure comprising a wire framework of the kind having two lateral side wires adapted to be suspended in a seat frame and between which extend a plurality of transverse wires providing load bearing support for upholstery of the seat.

[0002] Support structures of the aforementioned kind are very well known and may have various configurations determined by the design of seat in which the support structure is to be mounted (see p.e. FR-A-2 386 287 and WO-A- 95/00039).

[0003] Whilst such support structures have proved advantageous in hitherto known designs of seat, there is an increasing requirement, particularly in relation to seats for motor vehicles, that the seat back should provide adequate and anatomically correct support for an occupant of the seat in the lumbar region.

[0004] It is accordingly an object of the invention to provide a support structure of the aforementioned type that is capable of providing improved lumbar support.

[0005] In accordance with the invention a support structure of the aforementioned type is characterised in that one or more transverse wires extend laterally beyond the side wires after having been wound around the latter and terminate in hook-like fingers that extend generally in a plane parallel to a surface of the seat to be supported.

[0006] The fact that the extended portions of the transverse wires terminate in free ends acting as fingers, rather than being connected to an edge wire as in hitherto known constructions, enables more versatile lateral support to be provided, particularly in the lumbar region of a back rest, as the fingers can be individually angled, if desired, to conform to the contour of the seat back. The hooked ends of the wire fingers may also provide a convenient means for the suspension of the support structure in a seat frame, serving as anchorages for tension springs or like suspension means.

[0007] The fact that the laterally extending fingers are unconnected at their free ends also enables an effective adjustable lumbar support to be provided by arching of the two side wires under the action of a tension means, in known manner, as the freely extending fingers can provide laterally contoured support in the lumbar region without interfering with the arching of the two side wires.

[0008] If desired the two side wires may be angled to provide regions of the support structure of differing transverse widths between these side wires. Transverse wires extending between a wider section of the support structure may terminate at the side wires, so that the support structure combines an area having the characteristics of a known flat support with an area having lateral support provided by the extended wire fingers in accordance with the invention.

[0009] Further preferred features and advantages of

the invention will become apparent from the following description taken in conjunction with the drawings, in which

5 Fig. 1 is a front view of a support structure in accordance with one embodiment of the invention, and

10 Fig. 2 is a similar view of a second embodiment of the invention.

[0010] Referring to fig. 1, a support structure comprises a pair of side wires 1 and 2 between which extend a plurality of transverse wires 3 that are anchored to the side wires 1 and 2 by being wound around the latter and then extend beyond the side wires at 4 to terminate in hooked ends 5 that extend generally in the plane of a surface of the seat to be supported.

[0011] In known manner the side wires 1 and 2 are provided with a covering of paper or plastic material that is gripped by the wound portions of the wires 3 and serves to maintain the spacing of the latter along the side wires 1 and 2. The lower ends of the wires 1 and 2 as viewed in the drawing are interconnected by a U-shaped transverse wire 6 of similar gauge and construction to the wires 1 and 2, the wire 6 being secured to the wires 1 and 2 by means of clips, in known manner. A similar transverse wire 7 is provided in the region of the upper ends of the wires 1 and 2.

[0012] The upper ends of the wires 1 and 2 are angled outwardly as illustrated and are secured to further L-shaped side wires 8 and 9 by means of clips.

[0013] The clipping together of the separate wires 1, 8 and 2, 9 allows relative pivotal movement of the linked wires about a transverse axis as described below.

[0014] The side wires 8 and 9 are of similar gauge and construction to the wires 1 and 2 and support further transverse wires 10 that are anchored to the side wires in known manner. Also in known manner, the wires 10 extend through a centre cord 11 of paper or synthetic plastic material which serves to maintain the vertical spacing of the wires 10.

[0015] The support structure can be supported in a seat frame, indicated in broken lines at 12 in fig. 1, by means of tension springs indicated in broken lines at 13, anchored between the seat frame 12, the side wires 8 and 9 on the one hand and the hooked ends of upper and lower transverse wires 3 on the other.

[0016] The support structure so far described could be used to provide non-adjustable lumbar support, but preferably means is provided for adjustable arching of the side wires 1 and 2 to enable horizontal adjustment of the lumbar support. For this purpose stirrup shaped wires 14 and 15 are clipped to the wires 6 and 7 respectively and provide support for anchor blocks 16 and 17 respectively supporting a cable 18 and outer sheath 19 of a Bowden cable coupled to an actuating mechanism 20 indicated in broken lines and mounted on the seat frame

12. Upon actuation of the cable mechanism, the two anchor blocks 16 and 17 are drawn towards one another under tension thus causing the side wires 1 and 2 to be arched in an adjustable manner in order to provide the required lumbar support.

[0017] It will be appreciated that arching of the wires 1 and 2 does not cause undesired displacement of the side wires 8 and 9 in a horizontal direction, as the side wires 8 and 9 can pivot relatively to the wires 1 and 2 about a transverse axis.

[0018] If desired, means can also be provided for the vertical displacement of the complete support structure in the seat frame 12 for corresponding vertical adjustment of the position of lumbar support.

[0019] The arrangement described provides a novel and versatile support structure particularly for a vehicle seat. The upper part of the support is of optimum width for support of the seat upholstery, whereas the dimension of the lower portion of the structure between the side wires 1 and 2 is of the optimum width for providing lumbar support whilst the finger ends of the side wires 3 can be cantilevered to form lateral wings providing sideways support in the lumbar region. All the required support is thus integrated in a single structure having the known advantages of the wire frame wherein the pitch and gauge of transverse wires can be varied to match the suspension loading in a cost effective manner.

[0020] The hooks in the transverse wires 3 enable rapid assembly of the structure in a seat frame and can also be used for trimming attachments.

[0021] The double cross wire support of the Bowden cable blocks braces the frame to enable application of the single cable tensioning mechanism to the wire frame structure in a simple and economic manner.

[0022] If desired the support structure can be tapered to match a seat profile.

[0023] Vertical adjustment of the support structure is also facilitated by virtue of the fact that the transverse wires linked to the tension springs 13 can flex in both the horizontal and vertical direction with movement of the support structure.

[0024] A further embodiment of the invention is illustrated in fig. 2 of the drawings in which like components are indicated with the same reference numerals as in fig. 1, and will not therefore be described in further detail.

[0025] In the arrangement of fig. 2 the tension springs 13 are replaced by extended portions of the transverse wires 3 and 10 that hook directly into apertures in the seat frame 12.

[0026] Since the side wires of the support structure are thus linked to the seat frame by inextensible means, intermediate portions 3a and 10a of the transverse wires 3 and 10 are angled in the plane of the support as illustrated, in order that the support structure itself becomes extensible under loading placed upon the seat.

Claims

1. A support structure for incorporation in a frame of a seat, comprising a wire framework having two lateral side wires (1,2) suspendible in the frame and between which extend a plurality of transverse wires (3) which provide load-bearing support for upholstery of the seat, wherein one or more transverse wires (3) extend laterally beyond the side wires (1,2) after having been wound around the latter, characterised in that said one or more transverse wires (3) terminate in free ends (5) that can flex independently of one another relatively to a portion of the framework bounded by said side wires (1,2), the said free ends (5) being formed into hook-like fingers hook portions of which extend in a plane generally parallel to the axis of an adjacent portion of the side wire (1,2) from which the respective transverse wire (3) extends.
2. A structure as claimed in Claim 1, further characterised in that the fingers (5) are individually angled to conform to the contour of the seat surface.
3. A structure as claimed in any preceding Claim, further characterised in that the fingers (5) are formed as eyes which provide anchorages for suspension means coupled to the frame.
4. A structure as claimed in any preceding Claim, further characterised in that the side wires (1,2) are angled (8,9) to provide regions of the structure of differing transverse width between the wires (1,2; 8,9).
5. A structure as claimed in Claim 4, further characterised in that at least some of the transverse wires (10) terminate at the side wires (8,9) in one or more regions of greater width.
6. A structure as claimed in any preceding Claim, further characterised in that a pair of stirrup shaped wires (14,15) are fastened respectively to spaced-apart transverse wires (6,7) each of which stirrup shaped wires (14,15) provide support for an anchor block (16,17) respectively supporting a cable (18) and outer sheath of a bowden cable coupled to an actuating mechanism mounted on the frame, the arrangement being such that upon actuation of the mechanism in a first sense, the two anchor blocks (16,17) are drawn towards one another under tension thus causing the side wires (1,2) to become arched in an adjustable manner whilst actuation in a second sense causes the anchor blocks (16,17) to move apart causing the side wires (1,2) to become less arched.

Patentansprüche

1. Tragstruktur zum Einbau in einen Rahmen eines Sitzes, umfassend ein Drahtgerüst mit zwei im Rahmen aufhängbaren, lateralen Seitendrähten (1, 2), zwischen denen sich eine Mehrzahl von Querdrähten (3) erstreckt, die eine Last tragende Abstützung für eine Sitzpolsterung bilden, wobei sich ein oder mehrere um die Seitendrähte (1, 2) herum gebogene Querdrähte (3) seitlich hinter diesen erstrecken, dadurch gekennzeichnet, dass ein oder mehrere Querdrähte (3) in freien Drahtenden (5) auslaufen, die sich unabhängig voneinander relativ zu einem durch die Seitendrähte (1, 2) begrenzten Gerüstabschnitt verformen können, und dass die freien Drahtenden (5) zu hakenartigen Fingern geformt sind, deren Hakenabschnitte sich in einer zur Achse eines benachbarten Abschnitts des Seitendrahts (1, 2) zumeist parallelen Ebene erstrecken, von der sich der entsprechende Querdraht (3) erstreckt.
2. Struktur nach Anspruch 1, dadurch gekennzeichnet, dass die Finger (5) individuell abgewinkelt sind, um der Kontur der Sitzoberfläche zu entsprechen.
3. Struktur nach einem der vorangehenden Ansprüche, dadurch gekennzeichnet, dass die Finger (5) als Ösen ausgebildet sind, die Verankerungen für mit dem Rahmen gekoppelte Aufhängemittel bilden.
4. Struktur nach einem der vorangehenden Ansprüche, dadurch gekennzeichnet, dass die Seitendrähte (1, 2) abgewinkelt (8, 9) sind, um Strukturabschnitte mit unterschiedlicher Querbreite zwischen den Drähten (1, 2; 8, 9) zu bilden.
5. Struktur nach Anspruch 4, dadurch gekennzeichnet, dass zumindest einige Querdrähte (10) an den Seitendrähten (8, 9) in einem oder mehreren Abschnitten mit größerer Breite enden.
6. Struktur nach einem der vorangehenden Ansprüche, dadurch gekennzeichnet, dass ein Paar bügelartig geformter Drähte (14, 15) jeweils an beabstandeten Querdrähten (6, 7) befestigt ist und jeder der bügelartig geformten Drähte (14, 15) eine Abstützung für einen Verankerungsblock (16, 17) bildet und jeweils einen Seilzug und eine Außenhülle eines Bowdenzugs abstützt, der mit einem am Rahmen angebrachten Betätigungsmechanismus gekoppelt ist, wobei die Anordnung derart ist, dass die zwei Verankerungsblöcke (16, 17) bei Betätigung des Mechanismus in einer ersten Richtung unter Spannung aufeinander zu bewegt werden und dadurch die Seitendrähte (1, 2) veranlassen, sich in verstellbarer Weise zu wölben, wohingegen eine Betätigung in einer zweiten Richtung die Veranke-

rungsblöcke (16, 17) veranlasst, sich voneinander weg zu bewegen, so dass die Seitendrähte (1, 2) veranlasst werden, sich weniger zu wölben.

Revendications

1. Structure de support à incorporer dans un cadre d'un siège, comprenant un châssis en fil ayant deux fils latéraux (1, 2) susceptibles d'être suspendus dans le cadre et entre lesquels s'étendent une pluralité de fils transversaux (3) qui fournissent un support acceptant une charge pour le capitonnage du siège, dans laquelle un ou plusieurs fils transversaux (3) s'étendent latéralement au-delà des fils latéraux (1, 2) après avoir été enroulés autour de ces derniers, **caractérisée en ce que** lesdits un ou plusieurs fils transversaux (3) se terminent en extrémité libre (5) pouvant fléchir indépendamment les uns des autres par rapport à une partie du châssis délimité par lesdits fils latéraux (1, 2), lesdites extrémités libres (5) étant conformées en partie de crochet en forme de doigts qui s'étendent dans un plan généralement parallèle à l'axe d'une partie voisine dudit fil latéral (1, 2) à partir duquel s'étend le fil transversal respectif (3).
2. Structure selon la revendication 1, **caractérisée en outre en ce que** les doigts (5) forment individuellement des angles afin de se conformer au contour de la surface du siège.
3. Structure selon une quelconque des revendications précédentes, **caractérisée en outre en ce que** les doigts (5) sont conformés en oeillets qui fournissent un ancrage aux moyens de suspension couplés au châssis.
4. Structure selon une quelconque des revendications précédentes, **caractérisée en outre en ce que** les fils latéraux (1, 2) forment des angles (8, 9) pour fournir des régions de la structure de largeur transversale différente entre les fils (1,2); (8,9).
5. Structure selon la revendication 4, **caractérisée en outre en ce qu'au moins certains des fils transversaux (10) se terminent au niveau des fils latéraux (8, 9) dans une ou plusieurs régions de largeur supérieure.**
6. Structure selon une quelconque revendication précédente, **caractérisée en outre en ce qu'une** paire de fils en forme d'étrier (14, 15) sont fixés respectivement à des fils transversaux espacés (6, 7), chacun de ces fils en forme d'étrier (14, 15) fournissant un support à un bloc d'ancrage (16, 17) respectivement supportant un câble (18) et la gaine extérieure d'un câble Bowden couplé à un mécanisme d'ac-

tionnement monté sur le châssis, la configuration étant telle qu'à l'actionnement du mécanisme dans un premier sens les deux blocs d'ancrage (16, 17) sont tirés l'un vers l'autre sous tension, en faisant ainsi en sorte que les fils latéraux (1, 2) deviennent 5 arqués de manière ajustable, tandis qu'un actionnement dans un deuxième sens provoque un éloignement des blocs d'ancrage (16, 17) les uns des autres en faisant en sorte que les fils latéraux (1,2) deviennent moins arqués. 10

15

20

25

30

35

40

45

50

55

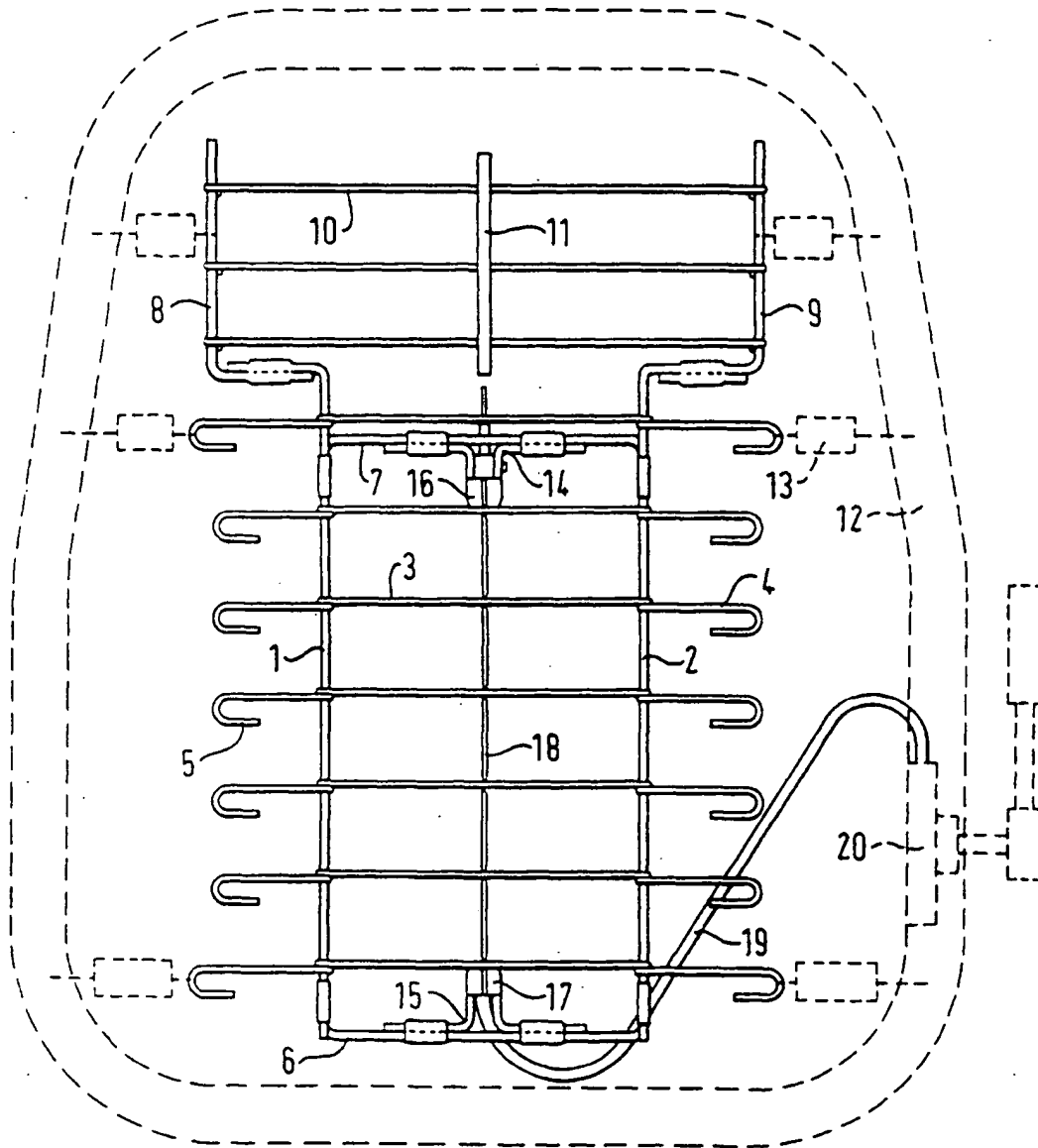


FIG.1

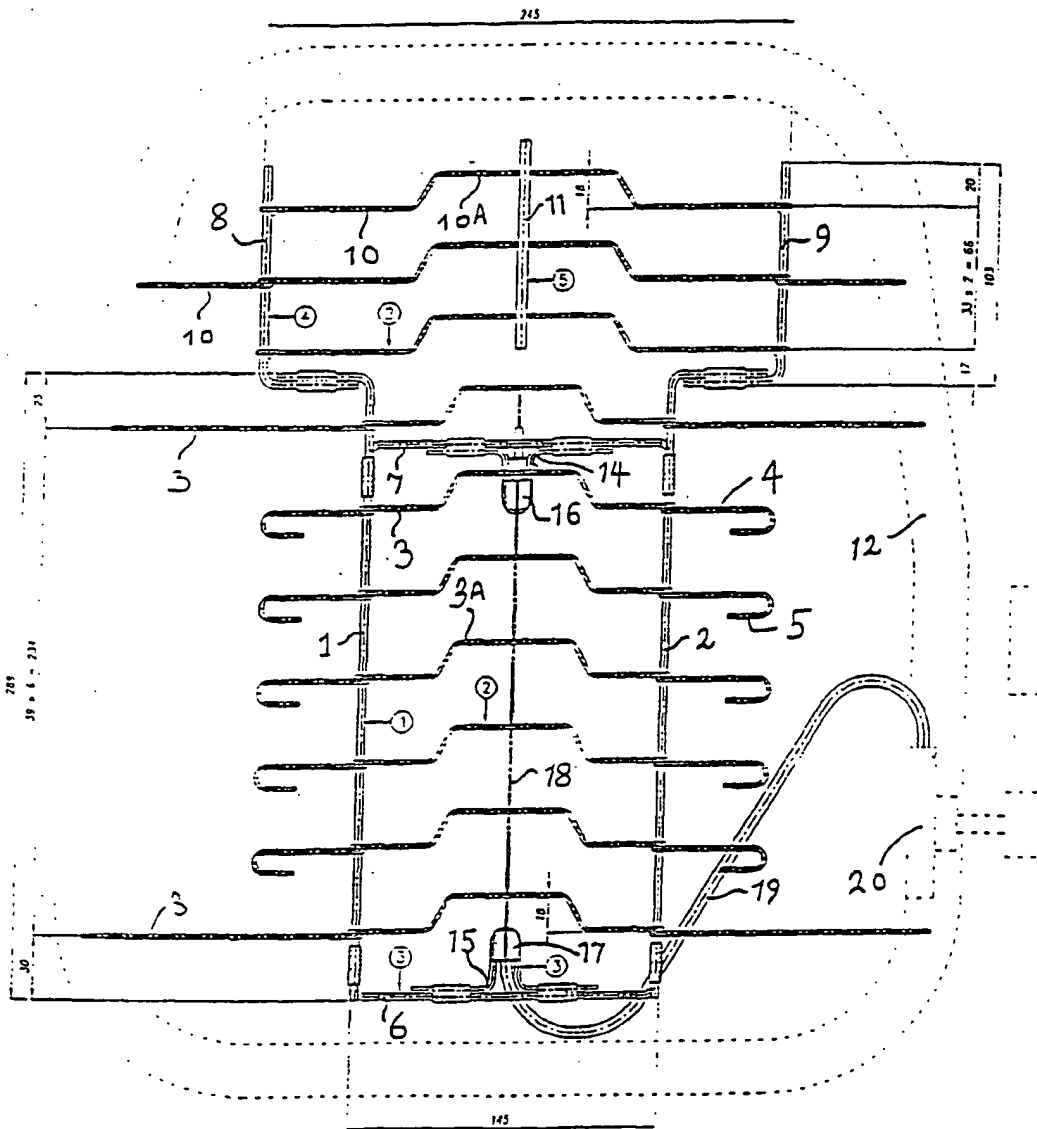


Fig 2